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**Intermountain
Forest and Range
Experiment Station
Ogden, UT 84401**

Resource
Bulletin
INT-28

January 1983

Forest Area and Timber Resource Statistics for State and Private Lands in Southwestern Montana, 1978

**Dorothy G. Felt
Velma J. Sterrett**

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THE AUTHORS

DOROTHY G. FELT is a Supervisory Statistical Assistant with the Resources Evaluation Research Work Unit at the Intermountain Forest and Range Experiment Station in Ogden, Utah.

VELMA J. STERRETT is a Statistical Assistant with the Resources Evaluation Research Work Unit at the Intermountain Forest and Range Experiment Station in Ogden, Utah.

RESEARCH SUMMARY

Presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Resources Evaluation standards.

ACKNOWLEDGMENTS

The Intermountain Station gratefully acknowledges the cooperation of the Montana Department of State Lands, Division of Forestry; and the Forest Service, Region 1, Division of State and Private Forestry. Appreciation is also expressed for the cooperation of other public agencies and private landowners in providing information and access to the sample locations.

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Forest Area and Timber Resource Statistics for State and Private Lands in Southwestern Montana, 1978

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INTRODUCTION

This resource bulletin presents the principal findings of the second forest inventory of State, private, and other lands in Mineral, Missoula, and Ravalli Counties in Southwestern Montana (fig. 1). Data collection began in January 1978 and was completed in November 1978. This bulletin does not note changes and trends since the inventory of western Montana in 1958, nor does it contain estimates of timber removals. These items will be included in a State Analytical Report to be published in the near future.

The primary objective of Resources Evaluation, a continuing nationwide undertaking conducted by the USDA Forest Service, is to provide an assessment of the renewable resource situation on the Nation's forests and rangelands. Fundamental to the accomplishment of this objective are the periodic State-by-State resource inventories. Originally, Resources Evaluation—formerly Forest Survey—was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, and western South Dakota are administered by the Intermountain Forest and Range Experiment Station, with headquarters in Ogden, Utah. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information on Federal lands, provide a basis for the formulation of forest policies and programs and for the orderly development and use of the resources.

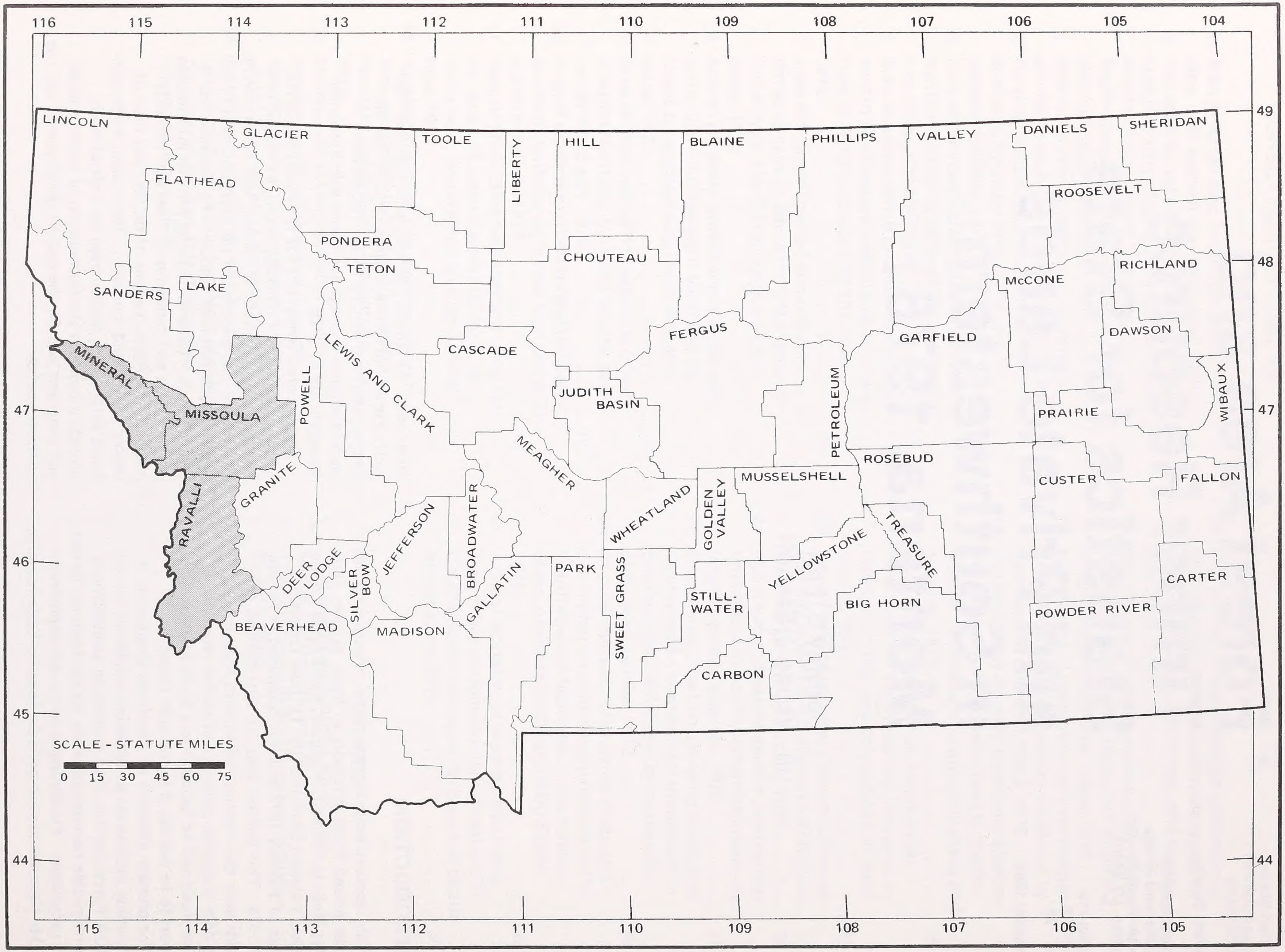

Figure 1.—Southwestern Montana counties: Mineral, Missoula, and Ravalli.

HIGHLIGHTS

Area

- State and private lands account for 1,402 thousand acres (567 thousand hectares), 35 percent of the total land area in Southwestern Montana (fig. 2).
- Forests occupy 889 thousand acres (360 thousand hectares), 63 percent of the total State and private land area.
- Of the forest land, 884 thousand acres (358 thousand hectares), 99 percent, are classified as commercial timberland.
- Private ownership accounts for 758 thousand acres (307 thousand hectares), 86 percent of the commercial timberland.
- Douglas-fir, ponderosa pine, lodgepole pine, and western larch are the predominant forest types and occupy 88 percent of the commercial timberland.
- Almost 57 percent of the commercial timberland is in the 50 to 84 cubic feet per acre per year site class, and 87 percent of such land is privately owned.

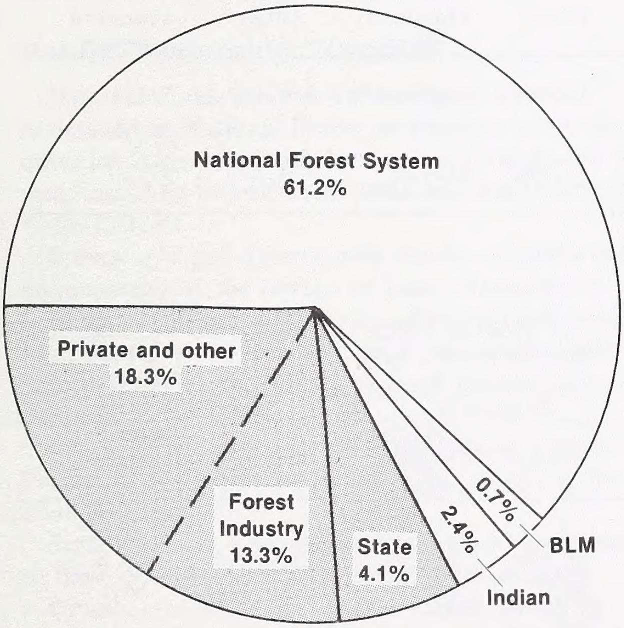

Figure 2.—Total land area in Southwestern Montana, by ownership.

Inventory

- Growing stock volume amounts to 1,401 million cubic feet (40 million cubic meters), and sawtimber volume totals 5,129 million board feet.[1]
- Rough, rotten, and salvable dead trees comprise 99.6 million cubic feet (2.8 million cubic meters), 7 percent of the total sound wood volume.
- The largest share of the total growing stock volume is made up of Douglas-fir (33 percent), lodgepole pine (21 percent), ponderosa pine (20 percent), and western larch (11 percent). The remaining percentage is made up of 9 other species (table 16).
- Private owners control almost 85 percent of the total growing stock and 84 percent of the sawtimber volume.

Growth and Mortality

- Net annual growth totals 26,905 thousand cubic feet (762 thousand cubic meters).
- Of the total net growth, 86 percent is on private lands.
- The annual mortality of 10,212 thousand cubic feet (290 thousand cubic meters) offsets 28 percent of the gross annual growth.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and study-area levels. Procedures were as follows:

1. Initial area estimates were based on the classification of 11,347 sample points systematically placed on the latest resource aerial photography available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the field samples.
2. Land classification and estimates of timber characteristics and volume were based on observations and measurements recorded at 480 ground sample locations. Sample trees were selected using a 10-point cluster that includes fixed plots (1/300 acre) for trees less than 5.0 inches diameter at breast height (d.b.h.) and variable plots (40 basal area factor) for trees 5.0 inches d.b.h. or larger.
3. For most species, volume and defect were computed using Kemp's equations.

---

[1] International 1/4-inch rule.

4. All photo and field data were sent to Ogden, Utah, for processing. Final estimates were based on computer-generated statistical summaries of the data.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on very small sample sizes, and so result in high sampling errors. The standard error percents shown in tables 1 and 2 were calculated at the 67 percent confidence level.

TERMINOLOGY AND DATA TABLES

The following section contains definitions that are relevant to the timber resource data presented in this resource bulletin. Forest area and timber resource data for Southwestern Montana are displayed in tables 3 through 24.

TERMINOLOGY

Land

Bureau of the Census.—Area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds less than 40 acres in area.

Resources Evaluation.—The same as the Bureau of the Census, except minimum width of streams, etc., is 120 feet, and minimum size of lakes, etc., is 1 acre.

Water

Bureau of the Census water.—Streams, sloughs, estuaries, and canals more than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds more than 40 acres in area.

Resources Evaluation.—The same as the Bureau of the Census except minimum width of streams, etc., is 120 feet, and minimum size of lakes, etc., is 1 acre.

Table 1.--Area of forest land in Southwestern Montana, with percent standard error, 1978

Item	Softwood types		Hardwood types		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Commercial timberland	868,306	±1.3	15,204	±33.1	883,510	±1.1
Other forest land:						
Unproductive nonreserved	2,289	±100.0	1,890	±100.0	4,179	±71.0

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on commercial timberland in Southwestern Montana, with percent standard error, 1978

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume:						
Growing stock (M cubic feet)	1,375,853	±4.0	25,579	±34.2	1,401,432	±4.0
Sawtimber (M board feet[1])	5,033,252	±4.9	96,072	±36.1	5,129,324	±4.9
Net annual growth:						
Growing stock (M cubic feet)	26,579	±9.0	326	±71.2	26,905	±8.9
Sawtimber (M board feet[1])	100,893	±9.1	1,892	±95.4	102,785	±9.1
Annual mortality:						
Growing stock (M cubic feet)	9,935	±13.9	277	±89.2	10,212	±14.0
Sawtimber (M board feet[1])	31,592	±18.9	1,343	±89.5	32,935	±18.9

[1] International 1/4-inch rule.

Land Use Classes

Forest land.—Land at least 10.0 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use.

Commercial timberland.—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Areas qualifying have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.)

Productive-reserved forest land.—Forest land sufficiently productive to qualify as commercial timberland, but withdrawn from timber utilization through statute, administrative designation, or exclusive use for Christmas tree production.

Other forest land.—Forest land incapable of producing 20 cubic feet per acre per year of industrial wood in natural stands because of adverse site conditions; includes both reserved and nonreserved forest land.

Nonforest land.—Land that has never supported forest and lands formerly forested where use for timber management is precluded by development for other uses.

Public Ownership Classes

National Forest lands.—Federal lands legally designated as National Forest or purchase units and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Bureau of Land Management lands.—Federal lands administered by the Bureau of Land Management.

Miscellaneous Federal lands.—Federal lands other than the following: (1) National Forest lands; (2) lands administered by the Bureau of Land Management; and (3) Indian trust lands.

Indian trust lands.—Indian lands held in trust by the Federal Government for Indian tribal groups or for individual allotments.

State lands.—Lands owned by States or lands leased to these governmental units for 50 years or more.

County and municipal lands.—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Private Ownership Classes

Forest industry lands.—Lands owned by companies or by individuals operating wood-processing plants.

Farmer-owned lands.—Lands owned by farm operators. (These exclude lands leased by farm operators from such nonfarm owners as railroad companies and States.)

Other private lands.—Privately owned lands other than forest industry and farmer-owned lands.

Forest Type and Tree Species

Forest types.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Forest trees.—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

Commercial species.—Tree species presently or prospectively suitable for industrial wood products.

Softwoods.—Monocotyledonous trees, usually evergreen, having needles or scalelike leaves.

Hardwoods.—Dicotyledonous trees, usually broad-leaved and deciduous.

Area Condition Classes

Stocking.—Stocking is an expression of the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking.

"Stocking percentages" express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land.

Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of the normal yield table values has been used to establish the lower limit of this range, which represents full-site occupancy. This is called 100-percent stocking. The upper limit of full stocking has been set at 132 percent. Sites with less than 100-percent stocking represent less than full-site occupancy. Overstocking is characterized by sites with 133 percent or more stocking.

Class 10.—Areas fully stocked (100 to 132 percent) with desirable trees and not overstocked (133 percent or more).

Class 20.—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30.—Areas medium to fully stocked (60 to 99 percent) with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50.—Areas poorly stocked (16.7 to 59 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60.—Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70.—Areas nonstocked (less than 16.7 percent) or poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80.—Low-risk old-growth stands.

Class 90.—High-risk old-growth stands.

Nonstocked.—Areas less then 16.7 percent stocked with growing stock trees.

Class of Timber

Growing stock trees.—Live trees of commercial species qualifying as desirable or acceptable trees. (Excludes rough, rotten, and dead trees.)

Desirable trees.—Growing stock trees (1) having no serious defect in quality to limit present or prospective use for timber products; (2) of relatively high vigor; and (3) containing no pathogens that may result in death or serious deterioration before rotation age.

Acceptable trees.—Growing stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Rough trees.—(l) Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet long or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of roughness or poor form; and (2) all live trees of noncommercial species.

Rotten trees.—Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet long or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume (cubic-foot basis) in a tree is rotten.

Salvable dead trees.—Standing or down dead trees that are considered merchantable by Rocky Mountain regional standards.

Saw-log portion.—That part of the bole of sawtimber trees between the stump and the saw-log top. A 1-foot stump is used.

Upper-stem portion.—That part of the bole of sawtimber trees above the saw-log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs, whichever occurs first.

Tree-Size Classes

Seedlings.—Live trees less than 1.0 inch in d.b.h.

Saplings.—Trees 1.0 to 4.9 inches in d.b.h.

Poletimber trees.—Trees at least 5.0 inches in d.b.h., but smaller than sawtimber size.

Sawtimber trees.—Trees exceeding poletimber size. In the Intermountain States, the minimum d.b.h. for softwood sawtimber is 9.0 inches and for hardwoods 11.0 inches.

Volume

Cull volume.—Portions of a tree's volume that are not usable for industrial wood products because of rot, form, or other defect.

Net volume.—Gross volume less deductions for cull.

Growing stock volume.—Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) outside bark. Net volume equals gross volume less deduction for rot and missing bole sections.

Sawtimber volume.—Net volume in board feet of sawtimber trees of commercial species. Net volume equals gross volume less deduction for rot, sweep, crook, and other defects that affect use for lumber.

Growth and Mortality

Net annual growth.—The increase in net growing stock volume of a specified size class for a specific year. (Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus the net volume of trees reaching the size class during the year, minus the net volume of trees that died during the year, minus the net volume of trees that became rough or rotten trees during the year.)

Mortality.—Number or sound-wood volume of growing stock trees dying from natural causes during a specified period, usually annually.

Site

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Site classifications are based upon the mean net annual growth of growing stock (not including thinnings or mortality loss) attainable at culmination of mean net annual growth over age. Height-age relationships are usually used as indicators of the specified volume-site class.

Stand-Size Classes

Sawtimber stands.—Stands at least 16.7 percent stocked with growing stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.—Stands at least 16.7 percent stocked with growing stock trees in which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.—Stands at least 16.7 percent stocked with growing stock trees in which more than half of the stocking is saplings and/or seedlings.

Nonstocked land.—Commercial timberland less than 16.7 percent stocked with growing stock trees.

FOREST SURVEY TABLES

Table 3.--Total land and water area in Southwestern Montana, by ownership class, 1978

Ownership class	Area	
	Acres	*Hectares*
National Forest	2,434,400	985 171
Bureau of Land Management	25,963	10 507
Indian Trust Lands	94,392	38 199
Forest industry	530,323	214 615
State	164,079	66 401
Private and other	707,585	286 350
Total land area	3,956,742	1 601 243
Census water	31,610	12 792
Gross water[1]	3,988,352	1 614 035

[1] U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area in Southwestern Montana, by major land class and ownership class, 1978

Land class	Ownership class						Total	
	State		Forest industry		Private[1]			
	Acres	*Hectares*	*Acres*	*Hectares*	*Acres*	*Hectares*	*Acres*	*Hectares*
Commercial timberland	125,846	50 928	478,293	193 559	279,371	113 058	883,510	357 545
Productive reserved	0	0	1,029	416	0	0	1,029	416
Other forest land:								
Unproductive reserved	0	0	686	278	0	0	686	278
Unproductive nonreserved	455	184	954	386	2,770	1 121	4,179	1 691
Total forest land	126,301	51 112	480,962	194 639	282,141	114 179	889,404	359 930
Nonforest land	37,778	15 289	49,361	19 976	425,444	172 171	512,583	207 436
Total land area	164,079	66 401	530,323	214 615	707,585	286 350	1,401,987	567 366

[1] On this and all following tables, the private ownership category includes a small portion of miscellaneous Federal, and county and municipal ownership.

Table 5.--Area of commercial timberland in Southwestern Montana, by forest type, stand-size class, and site class, 1978

Forest type and stand-size class	Site class					All classes
	165+	120-164	85-119	50-84	20-49	
	Acres					
Douglas-fir:						
Sawtimber	--	9,266	42,049	159,100	32,993	243,408
Poletimber	--	--	2,744	46,046	6,825	55,615
Sapling and seedling	--	2,290	5,408	63,550	22,810	94,058
Nonstocked	--	--	--	2,739	4,108	6,847
Total	--	11,556	50,201	271,435	66,736	399,928
Ponderosa pine:						
Sawtimber	--	12,440	44,503	54,347	18,545	129,835
Poletimber	--	--	2,408	2,743	9,930	15,081
Sapling and seedling	--	733	6,492	21,427	5,780	34,432
Nonstocked	--	--	--	5,405	3,022	8,427
Total	--	13,173	53,403	83,922	37,277	187,775
Lodgepole pine:						
Sawtimber	--	2,721	12,830	12,794	7,037	35,382
Poletimber	--	--	18,278	41,018	6,268	65,564
Sapling and seedling	--	--	2,744	5,514	8,546	16,804
Nonstocked	--	--	--	1,838	--	1,838
Total	--	2,721	33,852	61,164	21,851	119,588
Western larch:						
Sawtimber	--	--	9,058	23,247	2,684	34,989
Poletimber	--	--	--	5,657	--	5,657
Sapling and seedling	--	--	2,684	13,290	8,279	24,253
Nonstocked	--	--	--	1,227	--	1,227
Total	--	--	11,742	43,421	10,963	66,126
Western redcedar:						
Sawtimber	--	--	2,900	2,738	--	5,638
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	2,900	2,738	--	5,638
Whitebark pine:						
Sawtimber	--	--	--	2,913	--	2,913
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	2,913	--	2,913
Grand fir:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	2,500	--	2,500
Nonstocked	--	--	--	--	--	--
Total	--	--	--	2,500	--	2,500

(con.)

Table 5 (con.)

Forest type and stand-size class	Site class					All classes
	165+	120-164	85-119	50-84	20-49	
	Acres					
Subalpine fir-spruce:						
Sawtimber	--	8,212	8,179	13,616	2,721	32,728
Poletimber	--	--	2,721	5,451	1,355	9,527
Sapling and seedling	--	--	2,738	7,293	2,770	12,801
Nonstocked	--	--	--	--	--	--
Total	--	8,212	13,638	26,360	6,846	55,056
Engelmann spruce:						
Sawtimber	--	2,913	16,717	2,738	--	22,368
Poletimber	--	2,912	--	--	--	2,912
Sapling and seedling	--	--	2,770	--	--	2,770
Nonstocked	--	--	--	--	--	--
Total	--	5,825	19,487	2,738	--	28,050
Juniper[1]:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	732	--	732
Total	--	--	--	732	--	732
Aspen:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	1,345	--	--	1,345
Nonstocked	--	--	--	--	--	--
Total	--	--	1,345	--	--	1,345
Cottonwood:						
Sawtimber	--	--	5,952	3,232	--	9,184
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	1,616	1,616
Nonstocked	--	--	--	--	3,059	3,059
Total	--	--	5,952	3,232	4,675	13,859
All types:						
Sawtimber	--	35,552	142,188	274,725	63,980	516,445
Poletimber	--	2,912	26,151	100,915	24,378	154,356
Sapling and seedling	--	3,023	24,181	113,574	49,801	190,579
Nonstocked	--	--	--	11,941	10,189	22,130
Total	--	41,487	192,520	501,155	148,348	883,510

[1] On this and all following tables, the area occupied by juniper forest type classified as commercial is so classified because the site index for other associated species on these stands (usually ponderosa pine or Douglas-fir) was high enough to indicate a site potential productivity level exceeding 20 cubic feet per acre per year average annual growth, and nonstockable indicators were not present in sufficient quantities to lower the yield capability below 20 cubic feet per acre per year.

Although juniper usually occurs on unproductive forest land, when it occurs in mixtures with other species on productive sites, it is reported in the commercial timberland statistics.

Table 6.--Area of State-owned commercial timberland in Southwestern Montana, by forest type, stand-size class, and site class, 1978

Forest type and stand-size class	Site class					All classes
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - - - - - - *Acres*	- - - -	- - - -	- - - -	- - - -	- - - -
Douglas-fir:						
Sawtimber	--	1,704	9,190	29,461	6,148	46,503
Poletimber	--	--	--	8,131	1,338	9,469
Sapling and seedling	--	443	2,638	5,805	1,047	9,933
Nonstocked	--	--	--	--	1,338	1,338
Total	--	2,147	11,828	43,397	9,871	67,243
Ponderosa pine:						
Sawtimber	--	3,594	7,498	10,029	3,512	24,633
Poletimber	--	--	35	--	733	768
Sapling and seedling	--	47	1,212	1,251	338	2,848
Nonstocked	--	--	--	--	489	489
Total	--	3,641	8,745	11,280	5,072	28,738
Lodgepole pine:						
Sawtimber	--	--	5,162	940	1,671	7,773
Poletimber	--	--	3,742	3,160	928	7,830
Sapling and seedling	--	--	--	--	912	912
Nonstocked	--	--	--	762	--	762
Total	--	--	8,904	4,862	3,511	17,277
Western larch:						
Sawtimber	--	--	896	4,391	--	5,287
Poletimber	--	--	--	317	--	317
Sapling and seedling	--	--	--	34	--	34
Nonstocked	--	--	--	151	--	151
Total	--	--	896	4,893	--	5,789
Western redcedar:						
Sawtimber	--	--	244	--	--	244
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	244	--	--	244
Whitebark pine:						
Sawtimber	--	--	--	317	--	317
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	317	--	317
Grand fir:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	232	--	232
Nonstocked	--	--	--	--	--	--
Total	--	--	--	232	--	232

(con.)

Table 6 (con.)

Forest type and stand-size class	Site class					All classes
	165+	120-164	85-119	50-84	20-49	
	Acres					
Subalpine fir-spruce:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	133	1,355	1,488
Sapling and seedling	--	--	--	762	--	762
Nonstocked	--	--	--	--	--	--
Total	--	--	--	895	1,355	2,250
Engelmann spruce:						
Sawtimber	--	317	1,634	--	--	1,951
Poletimber	--	316	--	--	--	316
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	633	1,634	--	--	2,267
Juniper:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	46	--	46
Total	--	--	--	46	--	46
Aspen:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	658	--	--	658
Nonstocked	--	--	--	--	--	--
Total	--	--	658	--	--	658
Cottonwood:						
Sawtimber	--	--	179	178	--	357
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	90	90
Nonstocked	--	--	--	--	338	338
Total	--	--	179	178	428	785
All types:						
Sawtimber	--	5,615	24,803	45,316	11,331	87,065
Poletimber	--	316	3,777	11,741	4,354	20,188
Sapling and seedling	--	490	4,508	8,084	2,387	15,469
Nonstocked	--	--	--	959	2,165	3,124
Total	--	6,421	33,088	66,100	20,237	125,846

Table 7.--Area of industry-owned commercial timberland in Southwestern Montana, by forest type, stand-size class, and site class, 1978

Forest type and stand-size class	Site class					All classes
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - - - - - - - - Acres - - - - - - - - - - - - - - - -					
Douglas-fir:						
Sawtimber	--	3,704	20,059	91,228	21,833	136,824
Poletimber	--	--	2,744	23,116	5,487	31,347
Sapling and seedling	--	904	2,770	40,156	12,175	56,005
Nonstocked	--	--	--	2,739	2,770	5,509
Total	--	4,608	25,573	157,239	42,265	229,685
Ponderosa pine:						
Sawtimber	--	520	14,368	9,613	9,078	33,579
Poletimber	--	--	422	2,743	2,744	5,909
Sapling and seedling	--	89	2,684	13,788	2,721	19,282
Nonstocked	--	--	--	5,405	993	6,398
Total	--	609	17,474	31,549	15,536	65,168
Lodgepole pine:						
Sawtimber	--	2,721	--	5,539	2,770	11,030
Poletimber	--	--	5,487	27,414	2,744	35,645
Sapling and seedling	--	--	2,744	5,514	5,482	13,740
Nonstocked	--	--	--	--	--	--
Total	--	2,721	8,231	38,467	10,996	60,415
Western larch:						
Sawtimber	--	--	8,162	14,393	2,684	25,239
Poletimber	--	--	--	2,744	--	2,744
Sapling and seedling	--	--	2,684	11,304	8,279	22,267
Nonstocked	--	--	--	--	--	--
Total	--	--	10,846	28,441	10,963	50,250
Western redcedar:						
Sawtimber	--	--	--	2,738	--	2,738
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	2,738	--	2,738
Whitebark pine:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
Grand Fir:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	217	--	217
Nonstocked	--	--	--	--	--	--
Total	--	--	--	217	--	217

(con.)

Table 7 (con.)

Forest type and stand-size class	Site class					All classes
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	*Acres*	- - - - - - - - - -	- - - - - - - - - -
Subalpine fir-spruce:						
Sawtimber	--	8,212	8,179	13,616	2,721	32,728
Poletimber	--	--	2,721	3,510	--	6,231
Sapling and seedling	--	--	2,738	5,455	2,770	10,963
Nonstocked	--	--	--	--	--	--
Total	--	8,212	13,638	22,581	5,491	49,922
Engelmann spruce:						
Sawtimber	--	--	10,999	2,738	--	13,737
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	2,770	--	--	2,770
Nonstocked	--	--	--	--	--	--
Total	--	--	13,769	2,738	--	16,507
Juniper:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	89	--	89
Total	--	--	--	89	--	89
Aspen:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	90	--	--	90
Nonstocked	--	--	--	--	--	--
Total	--	--	90	--	--	90
Cottonwood:						
Sawtimber	--	--	2,917	197	--	3,114
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	98	98
Nonstocked	--	--	--	--	--	--
Total	--	--	2,917	197	98	3,212
All types:						
Sawtimber	--	15,157	64,684	140,062	39,086	258,989
Poletimber	--	--	11,374	59,527	10,975	81,876
Sapling and seedling	--	993	16,480	76,434	31,525	125,432
Nonstocked	--	--	--	8,233	3,763	11,996
Total	--	16,150	92,538	284,256	85,349	478,293

Table 8.--Area of privately owned commercial timberland in Southwestern Montana, by forest type, stand-size class, and site class, 1978

Forest type and stand-size class	Site class					All classes
	165+	120-164	85-119	50-84	20-49	
				Acres		
Douglas-fir:						
Sawtimber	--	3,858	12,800	38,411	5,012	60,081
Poletimber	--	--	--	14,799	--	14,799
Sapling and seedling	--	943	--	17,589	9,588	28,120
Nonstocked	--	--	--	--	--	--
Total	--	4,801	12,800	70,799	14,600	103,000
Ponderosa pine:						
Sawtimber	--	8,326	22,637	34,705	5,955	71,623
Poletimber	--	--	1,951	--	6,453	8,404
Sapling and seedling	--	597	2,596	6,388	2,721	12,302
Nonstocked	--	--	--	--	1,540	1,540
Total	--	8,923	27,184	41,093	16,669	93,869
Lodgepole pine:						
Sawtimber	--	--	7,668	6,315	2,596	16,579
Poletimber	--	--	9,049	10,444	2,596	22,089
Sapling and seedling	--	--	--	--	2,152	2,152
Nonstocked	--	--	--	1,076	--	1,076
Total	--	--	16,717	17,835	7,344	41,896
Western larch:						
Sawtimber	--	--	--	4,463	--	4,463
Poletimber	--	--	--	2,596	--	2,596
Sapling and seedling	--	--	--	1,952	--	1,952
Nonstocked	--	--	--	1,076	--	1,076
Total	--	--	--	10,087	--	10,087
Western redcedar:						
Sawtimber	--	--	2,656	--	--	2,656
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	2,656	--	--	2,656
Whitebark pine:						
Sawtimber	--	--	--	2,596	--	2,596
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	2,596	--	2,596
Grand Fir:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	2,051	--	2,051
Nonstocked	--	--	--	--	--	--
Total	--	--	--	2,051	--	2,051

(con.)

Table 8 (con.)

Forest type and stand-size class	Site class 165+	120-164	85-119	50-84	20-49	All classes
	Acres					
Subalpine fir-spruce:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	1,808	--	1,808
Sapling and seedling	--	--	--	1,076	--	1,076
Nonstocked	--	--	--	--	--	--
Total	--	--	--	2,884	--	2,884
Engelmann spruce:						
Sawtimber	--	2,596	4,084	--	--	6,680
Poletimber	--	2,596	--	--	--	2,596
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	5,192	4,084	--	--	9,276
Juniper:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	597	--	597
Total	--	--	--	597	--	597
Aspen:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	597	--	--	597
Nonstocked	--	--	--	--	--	--
Total	--	--	597	--	--	597
Cottonwood:						
Sawtimber	--	--	2,856	2,857	--	5,713
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	1,428	1,428
Nonstocked	--	--	--	--	2,721	2,721
Total	--	--	2,856	2,857	4,149	9,862
All types:						
Sawtimber	--	14,780	52,701	89,347	13,563	170,391
Poletimber	--	2,596	11,000	29,647	9,049	52,292
Sapling and seedling	--	1,540	3,193	29,056	15,889	49,678
Nonstocked	--	--	--	2,749	4,261	7,010
Total	--	18,916	66,894	150,799	42,762	279,371

Table 9.--Area of commercial timberland in Southwestern Montana, by stand volume and ownership class, 1978

Stand volume per acre[1]	Ownership class			
	State	Forest industry	Private	All owners
	- - - - - - - - - - Acres - - - - - - - - - -			
Less than 1,500 board feet	16,699	88,312	51,302	156,313
1,500 to 4,999 board feet	44,825	192,776	100,844	338,445
5,000 to 9,999 board feet	40,664	133,968	90,902	265,534
10,000 board feet or more	23,658	63,237	36,323	123,218
All classes	125,846	478,293	279,371	883,510

[1] International 1/4-inch rule.

Table 10.--Area of commercial timberland in Southwestern Montana, by forest type and area condition class, 1978

Forest type	Area condition class									Nonstocked	All classes	
	10	20	30	40	50	60	70	80	90			
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -											Hectares
Douglas-fir	--	--	9,078	20,385	17,876	125,238	86,513	70,360	63,631	6,847	399,928	161 846
Ponderosa pine	--	--	22,821	15,161	3,635	65,951	40,864	15,327	15,589	8,427	187,775	75 990
Lodgepole pine	3,356	5,514	2,738	20,869	41,180	12,428	12,931	2,770	15,964	1,838	119,588	48 396
Western larch	2,738	--	8,284	13,255	5,405	5,633	6,350	16,275	6,959	1,227	66,126	26 760
Western redcedar	--	--	--	2,900	--	--	--	--	2,738	--	5,638	2 282
Whitebark pine	--	--	--	--	--	--	--	2,913	--	--	2,913	1 179
Grand fir	--	--	--	--	--	2,500	--	--	--	--	2,500	1 012
Subalpine fir-spruce	--	--	2,738	6,076	--	10,933	6,767	19,026	9,516	--	55,056	22 280
Engelmann spruce	--	2,913	5,509	--	2,900	1,300	--	15,428	--	--	28,050	11 351
Juniper	--	--	--	--	--	--	--	--	--	732	732	296
Aspen	--	--	--	--	--	1,345	--	--	--	--	1,345	544
Cottonwood	--	--	--	1,616	2,720	1,616	1,616	--	3,232	3,059	13,859	5 609
All types	6,094	8,427	51,168	80,262	73,716	226,944	155,041	142,099	117,629	22,130	883,510	357 545

Table 11.--Area of productive reserved and other forest land in Southwestern Montana, by land class, ownership class, and forest type, 1978

Land class	Douglas-fir	Lodgepole pine	Whitebark pine	Total softwoods	Mixed hardwoods	Total hardwoods	All types	
	Acres							Hectares
Productive reserved area:								
State	0	0	0	0	0	0	0	0
Forest industry	--	343	686	1,029	--	--	1,029	416
Private	0	0	0	0	0	0	0	0
Total	--	343	686	1,029	--	--	1,029	416
Other forest land area:								
Unproductive reserved:								
State	0	0	0	0	0	0	0	0
Forest industry	--	--	686	686	--	--	686	278
Private	0	0	0	0	0	0	0	0
Total	--	--	686	686	--	--	686	278
Unproductive nonreserved:								
State	443	--	--	443	12	12	455	184
Forest industry	903	--	--	903	51	51	954	386
Private	943	--	--	943	1,827	1,827	2,770	1 121
Total	2,289	--	--	2,289	1,890	1,890	4,179	1 691
Total all areas:								
State	443	0	0	443	12	12	455	184
Forest industry	903	343	1,372	2,618	51	51	2,669	1 080
Private	943	0	0	943	1,827	1,827	2,770	1 121
Total acres	2,289	343	1,372	4,004	1,890	1,890	5,894	--
Total hectares	926	139	555	1 620	765	765	--	2 385

Table 12.--Number of growing stock trees on commercial timberland in Southwestern Montana, by species and diameter class, 1978

Species	Diameter class (inches at breast height)														All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.0	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	- - - - - - - - - - - - - - *Thousand trees* - - - - - - - - - - - - - -															
Douglas-fir	43,333	28,610	15,828	12,441	7,233	4,283	2,141	1,421	803	469	235	105	81	29	42	117,054
Ponderosa pine	5,614	8,371	6,319	5,151	3,397	2,216	1,856	1,013	608	369	180	153	72	37	68	35,424
Western white pine	--	--	--	--	--	33	--	7	--	--	--	--	3	--	--	43
Lodgepole pine	15,676	17,732	16,770	10,383	4,138	1,295	586	130	45	9	4	--	--	--	--	66,768
Whitebark pine	--	--	136	153	105	98	16	--	3	--	--	--	--	--	--	511
Western larch	5,163	4,335	3,795	2,514	1,268	863	443	348	199	137	194	82	52	49	90	19,532
Grand fir	2,744	1,122	253	201	145	28	17	22	18	5	4	2	3	--	--	4,564
Subalpine fir	14,819	5,674	4,603	1,504	894	296	144	147	32	20	13	14	3	2	4	28,169
Engelmann spruce	6,092	4,741	2,356	834	771	547	407	297	164	85	76	39	33	2	55	16,499
Western redcedar	2,288	564	--	37	87	43	61	72	13	30	13	7	7	5	2	3,229
Total softwoods	95,729	71,149	50,060	33,218	18,038	9,702	5,671	3,457	1,885	1,124	719	402	254	124	261	291,793
Aspen	1,153	702	304	93	168	58	22	--	7	--	4	7	--	3	--	2,521
Cottonwood	531	161	206	41	12	55	19	22	20	18	17	13	11	7	42	1,175
Other hardwoods	--	--	--	30	64	--	21	16	--	5	--	--	--	--	--	136
Total hardwoods	1,684	863	510	164	244	113	62	38	27	23	21	20	11	10	42	3,832
All species	97,413	72,012	50,570	33,382	18,282	9,815	5,733	3,495	1,912	1,147	740	422	265	134	303	295,625

Table 13.--Number of cull and salvable dead trees on commercial timberland in Southwestern Montana, by ownership class, and softwoods and hardwoods, 1978

Ownership class and species group	Cull trees			Salvable dead trees
	Sound	Rotten	Total	
	- - - - - - - - - *Thousand trees* - - - - - - - - -			
State:				
Softwoods	255	76	331	2,472
Hardwoods	--	14	14	1
Total	255	90	345	2,473
Forest industry:				
Softwoods	867	274	1,141	7,840
Hardwoods	--	7	7	([1])
Total	867	281	1,148	7,840
Private:				
Softwoods	796	111	907	3,450
Hardwoods	--	86	86	10
Total	796	197	993	3,460
All owners:				
Softwoods	1,918	461	2,379	13,762
Hardwoods	--	107	107	11
Total	1,918	568	2,486	13,773

[1] Less than 500 trees.

Table 14.--Net volume of growing stock on commercial timberland in Southwestern Montana, by ownership class, forest type, and stand-size class, 1978

Ownership class	Forest type	Stand-size class				All classes	
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked		
		Thousand cubic feet					Thousand cubic meters
State:							
	Douglas-fir	82,639	13,723	6,456	--	102,818	2 912
	Ponderosa pine	39,419	531	1,321	126	41,397	1 172
	Lodgepole pine	25,265	20,210	11	--	45,486	1 288
	Western larch	10,932	576	29	--	11,537	327
	Western redcedar	731	--	--	--	731	20
	Whitebark pine	824	--	--	--	824	24
	Grand fir	--	--	52	--	52	2
	Subalpine fir-spruce	--	2,504	155	--	2,659	75
	Engelmann spruce	6,468	968	--	--	7,436	210
	Juniper	--	--	--	4	4	(1)
	Aspen	--	--	340	--	340	10
	Cottonwood	542	--	31	28	601	17
	All types	166,820	38,512	8,395	158	213,885	6 057
Forest industry:							
	Douglas-fir	232,767	36,311	24,782	392	294,252	8 332
	Ponderosa pine	53,777	5,175	8,997	1,320	69,269	1 962
	Lodgepole pine	28,383	111,441	10,307	--	150,131	4 251
	Western larch	44,809	5,414	10,252	--	60,475	1 712
	Western redcedar	10,125	--	--	--	10,125	287
	Whitebark pine	--	--	--	--	--	--
	Grand fir	--	--	49	--	49	1
	Subalpine fir-spruce	91,174	20,884	7,127	--	119,185	3 375
	Engelmann spruce	49,475	--	--	--	49,475	1 401
	Juniper	--	--	--	7	7	(1)
	Aspen	--	--	18	--	18	1
	Cottonwood	10,485	--	35	--	10,520	298
	All types	520,995	179,225	61,567	1,719	763,506	21 620
Private:							
	Douglas-fir	106,734	17,657	12,406	--	136,797	3 874
	Ponderosa pine	113,247	8,446	6,155	267	128,115	3 628
	Lodgepole pine	36,268	50,252	78	--	86,598	2 452
	Western larch	11,735	4,718	1,632	--	18,085	512
	Western redcedar	7,948	--	--	--	7,948	225
	Whitebark pine	6,755	--	--	--	6,755	191
	Grand fir	--	--	461	--	461	13
	Subalpine fir-spruce	--	1,974	--	--	1,974	56
	Engelmann spruce	19,811	7,934	--	--	27,745	786
	Juniper	--	--	--	49	49	1
	Aspen	--	--	123	--	123	3
	Cottonwood	8,662	--	501	228	9,391	266
	All types	311,160	90,981	21,356	544	424,041	12 007
All owners:							
	Douglas-fir	422,140	67,691	43,644	392	533,867	15 118
	Ponderosa pine	206,443	14,152	16,473	1,713	238,781	6 762
	Lodgepole pine	89,916	181,903	10,396	--	282,215	7 991
	Western larch	67,476	10,708	11,913	--	90,097	2 551
	Western redcedar	18,804	--	--	--	18,804	532
	Whitebark pine	7,579	--	--	--	7,579	215
	Grand fir	--	--	562	--	562	16
	Subalpine fir-spruce	91,174	25,362	7,282	--	123,818	3 506
	Engelmann spruce	75,754	8,902	--	--	84,656	2 397
	Juniper	--	--	--	60	60	1
	Aspen	--	--	481	--	481	14
	Cottonwood	19,689	--	567	256	20,512	581
	All types	998,975	308,718	91,318	2,421	1,401,432	39 684

[1] Less than 500 cubic meters.

Table 15.--Net volume of sawtimber on commercial timberland in Southwestern Montana, by ownership class, forest type, and stand-size class, 1978

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	
		Thousand board feet[1]				
State:						
	Douglas-fir	359,096	24,709	27,149	--	410,954
	Ponderosa pine	187,582	1,167	4,569	712	194,030
	Lodgepole pine	102,071	25,724	32	--	127,827
	Western larch	47,285	1,462	60	--	48,807
	Western redcedar	1,975	--	--	--	1,975
	Whitebark pine	2,852	--	--	--	2,852
	Grand fir	--	--	83	--	83
	Subalpine fir-spruce	--	3,490	278	--	3,768
	Engelmann spruce	20,996	2,022	--	--	23,018
	Juniper	--	--	--	20	20
	Aspen	--	--	698	--	698
	Cottonwood	2,604	--	57	105	2,766
	All types	724,461	58,574	32,926	837	816,798
Forest industry:						
	Douglas-fir	930,058	72,117	106,657	1,946	1,110,778
	Ponderosa pine	237,470	5,306	48,140	5,969	296,885
	Lodgepole pine	97,291	110,399	11,657	--	219,347
	Western larch	225,654	7,877	45,152	--	278,683
	Western redcedar	50,948	--	--	--	50,948
	Whitebark pine	--	--	--	--	--
	Grand fir	--	--	77	--	77
	Subalpine fir-spruce	443,183	47,685	31,156	--	522,024
	Engelmann spruce	248,312	--	--	--	248,312
	Juniper	--	--	--	38	38
	Aspen	--	--	94	--	94
	Cottonwood	46,873	--	63	--	46,936
	All types	2,279,789	243,384	242,996	7,953	2,774,122
Private:						
	Douglas-fir	430,185	34,174	44,055	--	508,414
	Ponderosa pine	524,260	20,847	21,951	1,515	568,573
	Lodgepole pine	120,028	72,554	230	--	192,812
	Western larch	55,216	11,986	3,394	--	70,596
	Western redcedar	21,484	--	--	--	21,484
	Whitebark pine	23,378	--	--	--	23,378
	Grand fir	--	--	730	--	730
	Subalpine fir-spruce	--	2,840	--	--	2,840
	Engelmann spruce	88,721	16,576	--	--	105,297
	Juniper	--	--	--	254	254
	Aspen	--	--	631	--	631
	Cottonwood	41,636	--	912	847	43,395
	All types	1,304,908	158,977	71,903	2,616	1,538,404
All owners:						
	Douglas-fir	1,719,339	131,000	177,861	1,946	2,030,146
	Ponderosa pine	949,312	27,320	74,660	8,196	1,059,488
	Lodgepole pine	319,390	208,677	11,919	--	539,986
	Western larch	328,155	21,325	48,606	--	398,086
	Western redcedar	74,407	--	--	--	74,407
	Whitebark pine	26,230	--	--	--	26,230
	Grand fir	--	--	890	--	890
	Subalpine fir-spruce	443,183	54,015	31,434	--	528,632
	Engelmann spruce	358,029	18,598	--	--	376,627
	Juniper	--	--	--	312	312
	Aspen	--	--	1,423	--	1,423
	Cottonwood	91,113	--	1,032	952	93,097
	All types	4,309,158	460,935	347,825	11,406	5,129,324

[1] International 1/4-inch rule.

Table 16.--Net volume of growing stock on commercial timberland in Southwestern Montana, by species and diameter class, 1978

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	47,272	71,242	72,071	69,727	49,683	46,215	34,374	25,398	15,165	7,875	8,170	3,357	6,863	457,412
Ponderosa pine	8,275	21,441	31,566	36,329	43,431	33,912	27,247	21,075	12,963	14,067	7,471	4,847	14,859	277,483
Western white pine	--	--	--	659	--	355	--	--	--	--	444	--	--	1,458
Lodgepole pine	85,779	96,711	60,912	28,843	17,531	5,023	2,008	471	266	--	--	--	--	297,544
Whitebark pine	625	1,133	1,370	1,858	330	--	125	--	--	--	--	--	--	5,441
Western larch	10,666	16,464	15,698	15,254	12,035	13,071	9,945	9,016	15,500	7,660	5,758	6,017	15,772	152,856
Grand fir	587	1,431	1,794	428	365	1,130	916	355	408	204	331	--	--	7,949
Subalpine fir	17,173	10,913	9,718	4,756	3,349	4,768	1,655	1,285	915	1,064	290	310	493	56,689
Engelmann spruce	7,872	5,972	10,765	12,759	13,507	13,565	10,491	6,435	7,378	4,450	4,276	334	13,437	111,241
Western redcedar	--	192	751	653	1,147	1,727	322	1,043	561	320	325	342	397	7,780
Total softwoods	178,249	225,499	204,645	171,266	141,378	119,766	87,083	65,078	53,156	35,640	27,065	15,207	51,821	1,375,853
Aspen	1,112	590	2,211	1,247	725	--	349	--	333	741	--	358	--	7,666
Cottonwood	349	264	105	918	385	514	808	764	920	730	835	714	8,446	15,752
Other hardwoods	--	206	737	--	467	509	--	242	--	--	--	--	--	2,161
Total hardwoods	1,461	1,060	3,053	2,165	1,577	1,023	1,157	1,006	1,253	1,471	835	1,072	8,446	25,579
All species	179,710	226,559	207,698	173,431	142,955	120,789	88,240	66,084	54,409	37,111	27,900	16,279	60,267	1,401,432

Table 17.--Net volume of sawtimber on commercial timberland in Southwestern Montana, by species and diameter class, 1978

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, International 1/4-inch rule											
Douglas-fir	259,893	341,429	260,008	251,705	191,199	143,134	86,002	44,890	47,235	19,536	40,229	1,685,260
Ponderosa pine	94,059	166,930	226,126	190,403	158,708	125,088	77,907	84,903	45,000	29,577	96,635	1,295,336
Western white pine	--	3,601	--	1,960	--	--	--	--	2,582	--	--	8,143
Lodgepole pine	243,892	167,557	100,760	28,223	11,053	2,554	1,452	--	--	--	--	555,491
Whitebark pine	5,863	10,748	1,880	--	686	--	--	--	--	--	--	19,177
Western larch	76,983	90,339	71,930	78,248	59,500	53,938	94,375	47,647	36,023	37,603	97,645	744,231
Grand fir	6,643	2,094	1,868	5,952	4,572	1,689	1,941	955	1,512	--	--	27,226
Subalpine fir	36,970	24,794	17,589	25,086	8,717	6,933	5,047	5,915	1,631	1,784	2,854	137,320
Engelmann spruce	45,397	70,028	73,354	72,743	55,576	33,919	39,849	24,961	24,529	1,952	82,802	525,110
Western redcedar	2,942	3,271	5,720	8,521	1,546	4,936	2,635	1,476	1,491	1,570	1,850	35,958
Total softwoods	772,642	880,791	759,235	662,841	491,557	372,191	309,208	210,747	160,003	92,022	322,015	5,033,252
Aspen	XXXXXXX	6,567	3,800	--	1,765	--	1,603	3,521	--	1,688	--	18,944
Cottonwood	XXXXXXX	4,723	1,959	2,538	3,873	3,580	4,193	3,285	3,777	3,275	39,746	70,949
Other hardwoods	XXXXXXX	--	2,410	2,598	--	1,171	--	--	--	--	--	6,179
Total hardwoods	XXXXXXX	11,290	8,169	5,136	5,638	4,751	5,796	6,806	3,777	4,963	39,746	96,072
All species	772,642	892,081	767,404	667,977	497,195	376,942	315,004	217,553	163,780	96,985	361,761	5,129,324

Table 18.--Net volume of growing stock and sawtimber on commercial timberland in Southwestern Montana, by ownership class and species, 1978

Ownership class	Species															
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark pine	Western larch	Grand fir	Subalpine spurce	Engelmann spruce	Western redcedar	Total softwoods	Aspen	Cotton-wood	Other hardwoods	Total hardwoods	All species
	GROWING STOCK Thousand cubic feet															
State	82,848	52,292	30	43,577	1,018	20,842	471	5,294	5,531	173	212,076	1,185	624	--	1,809	213,885
Forest industry	249,094	92,938	1,106	173,319	--	104,272	4,408	43,384	81,306	5,724	755,551	76	5,718	2,161	7,955	763,506
Private	125,470	132,253	322	80,648	4,423	27,742	3,070	8,011	24,404	1,883	408,226	6,405	9,410	--	15,815	424,041
Total	457,412	277,483	1,458	297,544	5,441	152,856	7,949	56,689	111,241	7,780	1,375,853	7,666	15,752	2,161	25,579	1,401,432
	GROWING STOCK Thousand cubic meters															
State	2 346	1 481	1	1 234	29	590	13	150	157	5	6 006	34	17	--	51	6 057
Forest industry	7 054	2 632	31	4 908	--	2 953	125	1 228	2 302	162	21 395	2	162	61	225	21 620
Private	3 553	3 745	9	2 284	125	785	87	227	691	53	11 559	181	267	--	448	12 007
Total	12 953	7 858	41	8 426	154	4 328	225	1 605	3 150	220	38 960	217	446	61	724	39 684
	SAWTIMBER Thousand board feet, International 1/4-inch rule															
State	316,007	256,121	163	94,542	3,948	111,092	1,678	6,723	19,951	720	810,945	3,181	2,672	--	5,853	816,798
Forest industry	933,174	436,170	6,204	266,422	--	526,715	16,854	113,455	414,638	27,413	2,741,045	--	26,898	6,179	33,077	2,774,122
Private	436,079	603,045	1,776	194,527	15,229	106,424	8,694	17,142	90,521	7,825	1,481,262	15,763	41,379	--	57,142	1,538,404
Total	1,685,260	1,295,336	8,143	555,491	19,177	744,231	27,226	137,320	525,110	35,958	5,033,252	18,944	70,949	6,179	96,072	5,129,324

Table 19.--Net volume of timber on commercial timberland in Southwestern Montana, by class of timber, and softwoods and hardwoods, 1978

Class of timber	Softwoods	Hardwoods	All classes
	Thousand cubic feet		
Sawtimber trees:			
Saw-log portion	858,704	16,744	875,448
Upper-stem portion	113,401	3,261	116,662
Total	972,105	20,005	992,110
Poletimber trees	403,748	5,574	409,322
All growing stock trees	1,375,853	25,579	1,401,432
Sound cull trees	7,741	--	7,741
Rotten cull trees	2,655	601	3,256
Salvable dead trees	88,275	350	88,625
All timber	1,474,524	26,530	1,501,054

Table 20.--Net volume of growing stock on commercial timberland in Southwestern Montana, by forest type and species, 1978

Forest type	Species										
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce	Western redcedar	Total softwoods
	Thousand cubic feet										
Douglas-fir	368,275	66,099	--	44,183	107	41,765	1,203	8,433	3,604	--	533,669
Ponderosa pine	30,766	200,624	--	1,074	--	3,642	369	--	391	--	236,866
Lodgepole pine	15,292	4,380	--	220,990	626	26,050	720	6,342	3,243	--	277,643
Western larch	20,267	3,892	352	6,797	--	48,293	3,922	2,962	3,612	--	90,097
Western redcedar	3,090	--	799	1,128	--	5,298	1,735	532	791	5,431	18,804
Whitebark pine	--	--	--	564	4,708	--	--	2,046	261	--	7,579
Grand fir	562	--	--	--	--	--	--	--	--	--	562
Subalpine fir-spruce	16,643	--	--	12,037	--	14,782	--	33,012	47,344	--	123,818
Engelmann spruce	2,517	418	307	10,771	--	11,899	--	3,302	49,952	1,952	81,118
Juniper	--	--	--	--	--	--	--	60	--	--	60
Aspen	--	151	--	--	--	--	--	--	--	--	151
Cottonwood	--	1,919	--	--	--	1,127	--	--	2,043	397	5,486
All types	457,412	277,483	1,458	297,544	5,441	152,856	7,949	56,689	111,241	7,780	1,375,853
	Thousand cubic meters										
All types	12 953	7 858	41	8 426	154	4 328	225	1 605	3 150	220	38 960

Forest type	Species				All speices	
	Aspen	Cottonwood	Other hardwoods	Total hardwoods		
	Thousand cubic feet					*Thousand cubic meters*
Douglas-fir	--	198	--	198	533,867	15 118
Ponderosa pine	460	1,455	--	1,915	238,781	6 762
Lodgepole pine	4,063	509	--	4,572	282,215	7 991
Western larch	--	--	--	--	90,097	2 551
Western redcedar	--	--	--	--	18,804	532
Whitebark pine	--	--	--	--	7,579	215
Grand fir	--	--	--	--	562	16
Subalpine fir-spruce	--	--	--	--	123,818	3 506
Engelmann spruce	2,597	941	--	3,538	84,656	2 397
Juniper	--	--	--	--	60	1
Aspen	330	--	--	330	481	14
Cottonwood	216	12,649	2,161	15,026	20,512	581
All types	7,666	15,752	2,161	25,579	1,401,432	--
	Thousand cubic meters					
All types	217	446	61	724	--	39 684

Table 21.--Net volume of sawtimber on commercial timberland in Southwestern Montana, by forest type and species, 1978

Forest type	Species										
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce	Western redcedar	Total softwoods
	Thousand board feet, International 1/4-inch rule										
Douglas-fir	1,349,006	316,883	--	127,277	--	196,767	5,854	19,543	13,833	--	2,029,163
Ponderosa pine	107,181	917,531	--	5,486	--	17,630	1,934	--	2,119	--	1,051,881
Lodgepole pine	46,137	23,584	--	340,210	2,091	104,870	1,676	4,662	10,248	--	533,478
Western larch	77,105	22,940	1,939	12,797	--	248,544	12,280	6,046	16,435	--	398,086
Western redcedar	12,274	--	4,542	--	--	22,578	5,482	2,270	2,136	25,125	74,407
Whitebark pine	--	--	--	2,642	17,086	--	--	5,089	1,413	--	26,230
Grand fir	890	--	--	--	--	--	--	--	--	--	890
Subalpine fir-spruce	80,133	--	--	33,970	--	74,430	--	89,092	251,007	--	528,632
Engelmann spruce	12,534	2,534	1,662	33,109	--	72,725	--	10,306	218,068	8,983	359,921
Juniper	--	--	--	--	--	--	--	312	--	--	312
Aspen	--	774	--	--	--	--	--	--	--	--	774
Cottonwood	--	11,090	--	--	--	6,687	--	--	9,851	1,850	29,478
All types	1,685,260	1,295,336	8,143	555,491	19,177	744,231	27,226	137,320	525,110	35,958	5,033,252

Forest type	Species				All species
	Aspen	Cottonwood	Other hardwoods	Total hardwoods	
	Thousand board feet, International 1/4-inch rule				
Douglas-fir	--	983	--	983	2,030,146
Ponderosa pine	655	6,952	--	7,607	1,059,488
Lodgepole pine	4,737	1,771	--	6,508	539,986
Western larch	--	--	--	--	398,086
Western redcedar	--	--	--	--	74,407
Whitebark pine	--	--	--	--	26,230
Grand fir	--	--	--	--	890
Subalpine fir-spruce	--	--	--	--	528,532
Engelmann spruce	12,903	3,803	--	16,706	376,627
Juniper	--	--	--	--	312
Aspen	649	--	--	649	1,423
Cottonwood	--	57,440	6,179	63,619	93,097
All types	18,944	70,949	6,179	96,072	5,129,324

Table 22.--Net annual growth of growing stock and sawtimber on commercial timberland in Southwestern Montana, by ownership class and species, 1978

Ownership class	Species															All species
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce	Western redcedar	Total softwoods	Aspen	Cottonwood	Other hardwoods	Total hardwoods	
	GROWING STOCK - - - Thousand cubic feet - - -															
State	1,335	921	1	996	-20	264	9	15	105	-6	3,620	8	18	--	26	3,646
Forest industry	3,725	1,713	-38	3,785	--	1,291	55	1,189	515	80	12,315	3	66	40	109	12,424
Private	2,629	3,259	6	3,136	-17	870	65	-50	807	-61	10,644	-26	217	--	191	10,835
Total	7,689	5,893	-31	7,917	-37	2,425	129	1,154	1,427	13	26,579	-15	301	40	326	26,905
	GROWING STOCK - - - Thousand cubic meters - - -															
State	37.8	26.1	([1])	28.2	-0.6	7.5	0.3	0.4	3.0	-0.2	102.5	0.2	0.5	--	0.7	103.2
Forest industry	105.5	48.5	-1.1	107.2	--	36.6	1.6	33.7	14.6	2.3	348.9	0.1	1.9	1.1	3.1	352.0
Private	74.4	92.3	0.2	88.8	-0.5	24.6	1.8	-1.4	22.8	-1.7	301.3	-0.7	6.1	--	5.4	306.7
Total	217.7	166.9	-0.9	224.2	-1.1	68.7	3.7	32.7	40.4	0.4	752.7	-0.4	8.5	1.1	9.2	761.9
	SAWTIMBER - - - Thousand board feet, International 1/4-inch rule - - -															
State	5,104	5,470	4	1,348	28	1,263	29	82	362	-30	13,660	110	48	--	158	13,818
Forest industry	16,329	9,334	-197	9,003	--	4,212	268	1,952	2,147	368	43,416	--	299	95	394	43,810
Private	13,201	18,347	39	8,105	61	1,626	189	703	1,874	-328	43,817	660	680	--	1,340	45,157
Total	34,634	33,151	-154	18,456	89	7,101	486	2,737	4,383	10	100,893	770	1,027	95	1,892	102,785

[1] Less than .05 cubic meters.

Table 23.--Annual mortality of growing stock and sawtimber on commercial timberland in Southwestern Montana, by ownership class, and softwoods and hardwoods, 1978

Species group and ownership class	Growing stock		Sawtimber
	Thousand cubic feet	*Thousand cubic meters*	*Thousand board feet*[1]
Softwoods:			
State	1,615	45.8	4,027
Forest industry	6,202	175.7	20,715
Private	2,118	60.0	6,850
Total	9,935	281.5	31,592
Hardwoods:			
State	29	0.8	138
Forest industry	2	0.1	9
Private	246	7.0	1,196
Total	277	7.9	1,343
All owners	10,212	289.4	32,935

[1] International 1/4-inch rule.

Table 24.--Annual mortality of growing stock and sawtimber on commercial timberland in Southwestern Montana, by cause of death and species, 1978

Cause of death	Species														
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce	Western redcedar	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	GROWING STOCK Thousand cubic feet														
Insects	541	676	--	438	--	95	35	89	41	--	1,915	--	--	--	1,915
Disease	274	--	73	350	--	--	--	211	--	--	908	66	--	66	974
Fire	474	56	--	--	--	--	--	--	--	--	530	--	32	32	562
Weather	1,218	39	--	352	--	234	--	98	618	--	2,559	63	--	63	2,622
Suppression	37	8	--	--	--	--	--	--	--	--	45	--	--	--	45
Unknown	590	307	--	1,281	73	339	--	575	282	103	3,550	116	--	116	3,666
Logging	229	31	--	51	--	--	--	--	117	--	428	--	--	--	428
Total	3,363	1,117	73	2,472	73	668	35	973	1,058	103	9,935	245	32	277	10,212
	GROWING STOCK Thousand cubic meters														
Insects	15.3	19.1	--	12.4	--	2.7	1.0	2.5	1.2	--	54.2	--	--	--	54.2
Disease	7.8	--	2.1	9.9	--	--	--	6.0	--	--	25.8	1.9	--	1.9	27.7
Fire	13.4	1.6	--	--	--	--	--	--	--	--	15.0	--	0.9	0.9	15.9
Weather	34.5	1.1	--	10.0	--	6.6	--	2.8	17.5	--	72.5	1.8	--	1.8	74.3
Suppression	1.0	0.2	--	--	--	--	--	--	--	--	1.2	--	--	--	1.2
Unknown	16.7	8.7	--	36.3	2.1	9.6	--	16.3	8.0	3.0	100.7	3.3	--	3.3	104.0
Logging	6.5	0.9	--	1.4	--	--	--	--	3.3	--	12.1	--	--	--	12.1
Total	95.2	31.6	2.1	70.0	2.1	18.9	1.0	27.6	30.0	3.0	281.5	7.0	0.9	7.9	289.4
	SAWTIMBER Thousand board feet, International 1/4-rule														
Insects	1,195	3,212	--	1,327	--	432	--	--	--	--	6,166	--	--	--	6,166
Disease	906	--	405	1,122	--	--	--	880	--	--	3,313	322	--	322	3,635
Fire	573	177	--	--	--	--	--	--	--	--	750	--	150	150	900
Weather	6,070	201	--	989	--	1,200	--	--	3,013	--	11,473	303	--	303	11,776
Suppression	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Unknown	1,537	1,172	--	1,635	--	1,290	--	1,416	1,274	507	8,831	568	--	568	9,399
Logging	694	--	--	--	--	--	--	--	365	--	1,059	--	--	--	1,059
Total	10,975	4,762	405	5,073	--	2,922	--	2,296	4,652	507	31,592	1,193	150	1,343	32,935

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Felt, Dorothy G.; Sterrett, Velma J. Forest area and timber resource statistics for State and private lands in Southwestern Montana, 1978. Resour. Bull. INT-28. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1983. 30 p.

Presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Resources Evaluation standards.

KEYWORDS: forest surveys (regional), forest area classification, stand volume

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